US EPA Comments on Final or Draft Survey Units Project Reports for Survey Units 234, 236, 238, 242, 243, 348,352, 353, 354, dated October or November 2014

Transmitted to US Department of the Navy January 12, 2015

Thank you for sending the following reports:

- *Final Survey Unit 234 Project Report Revision 1* (DCN: RMAC-0809-0002-0094.R1) dated October 2014
- *Final Survey Unit 236 Project Report* (DCN: RMAC-0809-0002-0108) dated October 2014
- *Final Survey Unit 238 Project Report* (DCN: RMAC-0809-0002-0109) dated October 2014
- *Final Survey Unit 242 Project Report* (DCN: RMAC-0809-0002-0110) dated October 2014
- *Final Survey Unit 243 Project Report* (DCN: RMAC-0809-0002-0111) dated October 2014
- *Draft Survey Unit 348 Project Report* (DCN: RMAC-0809-0015-0019) dated November 2014
- *Draft Survey Unit 352 Project Report* (DCN: RMAC-0809-0015-0020) dated November 2014
- *Draft Survey Unit 353 Project Report* (DCN: RMAC-0809-0015-0021) dated November 2014
- *Draft Survey Unit 354 Project Report* (DCN: RMAC-0809-0015-0022) dated November 2014

The reports were prepared for the Navy Base Realignment and Closure Program Management Office West by TetraTech EC, Inc. of San Diego. I appreciate the opportunity for EPA to review them.

For each of the survey units reviewed, both the cancer risks and the inferred annual dose rates estimated using the current version of EPA's PRG calculator at http://epa-prgs.ornl.gov/radionuclides/ are lower than the values that were provided by the Navy's contractor, as shown in the tables below.

The reports adequately demonstrates that the soil concentrations are sufficiently low that the risks from radionuclides fall within EPA's risk management range of 10^{-6} to 10^{-4}. While some formatting changes could make the reports more explicitly address CERCLA measures and help provide the reader with more context, EPA concurs with the Navy's finding that Survey Units 234, 236, 238, 242, 243, 348, 352, 353, 354 are suitable for release from institutional controls with respect to radioactive contamination using Superfund criteria. EPA accepts the present version of the reports.

Please note that other Contaminants of Concern (COCs) that are listed in the project report include a long list of chemicals that were not incorporated into the risk estimate.

Please also note that the Navy has listed 10CFR20 Subpart E, *Radiological Criteria for License Termination*, a release criterion of 25 mrem/yr, as a release criterion. The Navy should be advised tha10CFR20 Subpart E is *not* an Applicable or Relevant and Appropriate Requirement (ARAR) for Superfund cleanup.

Please feel free to contact me any time if you would like to discuss these comments.

Tables for Individual Survey Units

Survey Unit 234:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.152	--	--	0.0659	2.293E-06
^{137}Cs	0.040	--	--	0.0226	7.859E-07
^{226}Ra	-0.229	--	--	0.0000	0.000E+00
Total		0.641	8.393E-06	0.0885	3.078E-06
Trench Unit					
^{90}Sr	0.210	--	--	0.0910	3.167E-06
^{137}Cs	0.045	--	--	0.0254	8.841E-07
^{226}Ra	-0.267	--	--	0.0000	0.000E+00
Total		0.8654	1.127E-05	0.1164	4.052E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-7}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 236:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.152	--	--	0.0659	2.293E-06
^{137}Cs	0.040	--	--	0.0226	7.859E-07
^{226}Ra	-0.229	--	--	0.0000	0.000E+00
Total		0.4294	5.708E-06	0.0885	3.078E-06
Trench Unit					
^{90}Sr	0.212	--	--	0.0919	3.198E-06
^{137}Cs	0.040	--	--	0.0226	7.859E-07
^{226}Ra	-0.309	--	--	0.0000	0.000E+00
Total		0.5693	7.476E-06	0.1145	3.983E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-3}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 238:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.108	--	--	0.0468	1.629E-06
^{137}Cs	0.040	--	--	0.0226	7.859E-07
^{226}Ra	-0.153	--	--	0.0000	0.000E+00
Total		0.7101	9.128E-06	0.0694	2.415E-06
Trench Unit					
^{90}Sr	0.264	--	--	0.1144	3.982E-06
^{137}Cs	0.032	--	--	0.0181	6.287E-07
^{226}Ra	-0.506	--	--	0.0000	0.000E+00
Total		0.8846	1.133E-05	0.1325	4.611E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-3}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 242:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.107	--	--	0.0464	1.614E-06
^{137}Cs	0.043	--	--	0.0243	8.448E-07
^{226}Ra	-0.039	--	--	0.0000	0.000E+00
Total		0.379	5.094E-06	0.0707	2.459E-06
Trench Unit					
^{90}Sr	0.194	--	--	0.0841	2.926E-06
^{137}Cs	0.034	--	--	0.0192	6.680E-07
^{226}Ra	-0.430	--	--	0.0000	0.000E+00
Total		0.6032	7.866E-06	0.1033	3.594E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-3}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 243:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.070	--	--	0.0303	1.056E-06
^{137}Cs	0.040	--	--	0.0226	7.859E-07
^{226}Ra	-0.087	--	--	0.0000	0.000E+00
Total		0.3005	4.084E-06	0.0529	1.842E-06
Trench Unit					
^{90}Sr	0.202	--	--	0.0876	3.047E-06
^{137}Cs	0.037	--	--	0.0209	7.269E-07
^{226}Ra	-0.297	--	--	0.0000	0.000E+00
Total		0.7153	9.307E-06	0.1084	3.774E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-1}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 348:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.141	--	--	0.0359	1.248E-06
^{137}Cs	0.021	--	--	0.0111	3.846E-07
^{226}Ra	0.050	--	--	0.0263	9.158E-07
Total		1.448	2.128E-05	0.0732	2.548E-06
Trench Unit					
^{90}Sr	0.147	--	--	0.0374	1.301E-06
^{137}Cs	0.021	--	--	0.0111	3.846E-07
^{226}Ra	-0.103	--	--	0	0
Total		0.6229	8.027E-06	0.0484	1.686E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-3}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 352:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.112	--	--	0.0485	1.689E-06
^{137}Cs	0.021	--	--	0.0119	4.126E-07
^{226}Ra	-0.084	--	--	0	0.000E+00
Total		0.3596	4.694E-06	0.0604	2.102E-06
Trench Unit					
^{90}Sr	0.070	--	--	0.0303	1.056E-06
^{137}Cs	0.019	--	--	0.0107	3.733E-07
^{226}Ra	-0.104	--	--	0	0.000E+00
Total		0.236	3.117E-06	0.0411	1.429E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-4}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 353:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.128	--	--	0.0555	1.931E-06
^{137}Cs	0.020	--	--	0.0113	3.929E-07
^{226}Ra	-0.108	--	--	0.0000	0.000E+00
Total		0.7101	9.128E-06	0.0668	2.324E-06
Trench Unit					
^{90}Sr	0.081	--	--	0.0351	1.222E-06
^{137}Cs	0.020	--	--	0.0113	3.929E-07
^{226}Ra	-0.079	--	--	0.0000	0.000E+00
Total		0.8846	1.133E-05	0.0464	1.615E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-3}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)

Survey Unit 354:

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Backfill					
^{90}Sr	0.089	--	--	0.0386	1.342E-06
^{137}Cs	0.021	--	--	0.0119	4.126E-07
^{226}Ra	-0.043	--	--	0.0000	0.000E+00
Total		0.2257	2.999E-06	0.0504	1.755E-06
Trench Unit					
^{90}Sr	0.078	--	--	0.0338	1.176E-06
^{137}Cs	0.019	--	--	0.0107	3.733E-07
^{226}Ra	-0.100	--	--	0.0000	0.000E+00
Total		0.1989	2.647E-06	0.0445	1.550E-06

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors now use updated dosimetry and a risk/dose coefficient of $11.4X10^{-3}$ per mrem as described in *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population* EPA 402-R-11-001 dated April 2011 (also known as the *Blue Book*)